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15 July 1983

SERVICE BULLETIN 114

SUBJECT Loose valve stem packing nut on vapor pilot light valves used on Raven fuel tanks and burner assemblies.

APPLICABILITY This valve has been used on all new production Raven fuel tanks and burner assemblies since February 1977. It may have also been supplied as a replacement part for fuel tanks and burner assemblies manufactured before February 1977.

This valve is manufactured by Nupro Company, 4800 East 345th Street, Willoughby, OH. It carries Nupro P/N B-4JAR2 or B-4JR2. The valve is identified by a dark green handle and the P/N 4JAR2 or 4JR2 metal-stamped on the brass valve body.

PROBLEM A recent incident occurred as a balloon pilot was performing the preflight operations. He opened the Nupro tank pilot light valve on the fuel tank. As he rotated the handle to the full open position, the valve stem packing nut with valve stem and handle separated from the valve body, causing a large propane leak. An unknown ignition source ignited the propane. The basket, burner and envelope were consumed by fire as the fuel tank emptied its contents. The pilot jumped clear and escaped with minor burns to his arms and face.

Evidently, the packing nut had loosened in service. When the pilot opened the valve the approximately four turns to the full open position, the packing nut was not sufficiently tight enough to prevent unscrewing the packing nut from the valve body. As the valve is opened and closed in service, the valve stem packing is subject to wear which effectively reduces the tightness of the valve stem packing nut. If not periodically retightened, the valve stem packing nut may loosen enough for an incident such as the above to occur. For normal operation, after initial opening of the valve, some resistance should be felt as the valve handle is rotated. If the handle turns with little or no resistance, the valve stem packing nut is not sufficiently tight.

Wear of the valve stem packing is dependent both upon the number of times the valve is opened and closed and on the extent to which the valve is opened each time. That is, fully opening the valve four turns causes more wear of the valve stem packing than only opening the valve one-half or one turn.

CORRECTIVE ACTION The following corrective action is considered preventive maintenance and may be performed by the holder of a pilot certificate on any aircraft he owns or operates that is not used in air carrier service. It may also be performed by certified repair stations or mechanics. Paragraph 2 has become a part of the annual or 100-hour inspection.

1. (a) For purposes of flight, **do not open the Nupro vapor pilot light valve** used on Raven fuel tanks and burner assemblies **more than one-half to one full turn** from the closed position. This prevents separation of the valve stem and handle from the valve



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body since the valve handle needs to be rotated in the opening direction more than four complete turns for the valve stem packing nut to unscrew from the valve body.

The small fuel requirements of the burner pilot light are easily met with the valve opened no more than one-half to one full turn. In addition, wear of the valve stem packing is reduced, and pilot light opening/closing operations are easier and faster.

(b) Check for proper operation during opening of the pilot light valves. (For tank pilot light valves, insure pilot fuel line is connected to both tank and burner to prevent fuel leakage.) After initial opening force is overcome, some resistance should be felt as the valve handle is rotated. If the handle turns with little or no resistance, the valve stem packing nut needs to be tightened as outlined in the following paragraph.

2. At each annual or 100-hour inspection or if required by paragraph 1(b), tighten the valve stem packing nut using the following procedure:

(a) Remove all ignition sources from work area.

(b) For tank pilot light valves, insure pilot fuel line is connected to both tank and burner to prevent fuel leakage. Burner pilot light valves may be adjusted with or without the pilot fuel light connected.

(c) Open the valve by rotating the valve handle **counterclockwise two complete turns** from the closed position. (NOTE: This prevents damage to the valve stem tip when the valve stem packing nut is tightened.)

(d) Tighten the valve stem packing nut in a **clockwise** direction to a torque value of 60 in-lb or 5 ft-lbs.

CAUTION: If the valve stem packing nut is rotated in a counterclockwise or loosening direction, fuel will leak from the tank.

(NOTE: Torque values greater than 60 in-lb may make the valve difficult to operate.)

Recommended Tools:

- Torque wrench calibrated in in-lbs.
- 9/16" "crow's foot" wrench. (During use, the "crow's foot" must be oriented 90 degrees to the torque wrench to prevent inaccurate torque readings. See Figure 2.)

- OR -

- Torque wrench calibrated in in-lbs and a 9/16" socket. (Removal of the valve handle will be required before tightening the valve stem packing nut. When reinstalling valve handle, use a drop of medium-strength thread sealant, such as Loctite 242, on the set screw.)

- OR -

- An open-end 9/16" wrench and a scale or similar device used to measure a force applied perpendicular to the wrench. (Torque is the product of force multiplied by lever arm length about an axis of rotation. To determine force which must be applied to wrench, divide required torque value by wrench length from valve stem to point of application of force. Example: For a torque value of 60 in-lb, a six-inch effective wrench length requires a force of 10 lbs applied perpendicular to the wrench at its end [60 in-lb ÷ 6 in = 10 lbs force].)

- (e) Check for proper operation as described in 1(b) and that the valve shuts off completely when closed.

3. Make logbook entry as follows:

Preventive maintenance was performed on all tanks and burners in N-_____, the vapor valves were checked and/or adjusted as per Raven Service Bulletin 114, and it is returned to service.

DATE	SIGNATURE	PILOT CERT. #	TYPE
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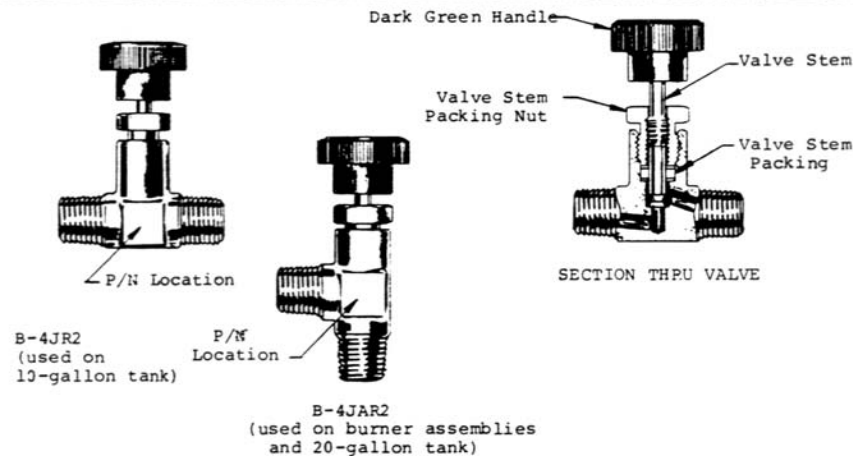


FIG. 1 VALVE IDENTIFICATION

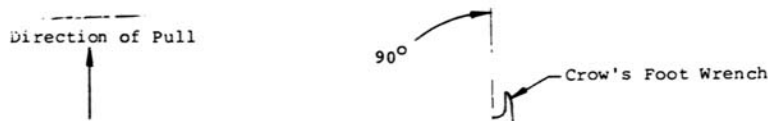


FIG. 2 CROW'S FOOT WRENCH ORIENTATION